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SAFETY ON THE FARM
IS MOSTLY HOMEMADE

Some Pointers on How to Reduce the
Accident Rate on Farms and in
Farm Homes X



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Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

SAFETY ON THE FARM IS MOSTLY HOMEMADE

Farm families--far more than city families--are on their own in safeguarding their working and living conditions. As agricultural engineers have put it: Safety on the farm is mostly homemade!

Accident figures continue to underscore the need for farm families to take every precaution to increase their own safety. More than 14,000 farm residents are killed by accidents annually, and more than a million are injured. The occupational death rate of farm workers is the third highest reported for all types of industry.

Following are selected facts and pointers which research workers of the Agricultural Research Service believe may be useful in reducing the accident rate on farms and in farm homes.

FARM MACHINERY

Manufacturers strive to build safety into farm machinery as one line of improvement. Shields are provided to cover more of the belts, gears, and other moving parts. Safety warnings are stamped on power machines as ever-present reminders. With all such advances, farm machines remain dangerous tools, always to be treated with alertness and care. Of the 70 deaths from farm work accidents occurring in 1952 in Minnesota, 35 were caused by farm machines. The harvesting of one corn crop in Iowa cost 326 fingers, 63 hands, 14 arms, 5 legs, and 3 lives.

In Farmers' Bulletin 2073, "Corn Production," Agricultural Research Service scientists chose the following safety pointers as their final words on harvesting the crop:

"Caution: Always stop the picker when cleaning the snapping or husking rolls or making any other adjustments."

"The corn picker is one of the most dangerous farm machines. It can cause the loss of hands, arms, and even lives. Such accidents are needless. Reverse gear attachments now manufactured, which fit many types of corn pickers, enable the operator to clear snapping rolls and gathering chains by reversing their action from the driver's seat. The increased safety afforded by these attachments makes their purchase and installation well worth while."

Special safety reminders are included in other publications, such as "Harvesting With Combines," FB-1761. When working with farm machinery, ARS machinery specialists stress such precautions as:

- (1) Stop a machine before cleaning, adjusting, or oiling any mechanism. Never do such jobs while the machine is in motion.
- (2) Don't put gasoline in the tank while the engine of a tractor or other machine is running.

- (3) Don't reach over to unclog knives of any machine with your hand. Use a stick, but first stop the machine and throw it out of gear.
- (4) Keep in place the guards provided to shield exposed parts.
- (5) Don't get on or off a harrow or disk plow while it is in motion. A misstep might cause you to fall in the path of the oncoming machine.
- (6) In no case step in front of a horse-hitched machine, such as a mower or binder, no matter how gentle the animal may be.
- (7) Don't let children play around power equipment, or give them rides on tractors or other machines. Although tractor accidents are mainly work accidents, when deaths from tractors in 2 States were charted by age groups it was shown that one out of 10 lives lost was that of a child under 5.

Tractors

More than two-thirds of the deaths caused by farm machinery involve tractors, according to 1950-51 accident reports. More than half of the deaths from tractors occur because the tractor overturns.

The most frequent cause of a tractor turning over sideways is loss of control from too much speed. Slow speeds are the only safe speeds. Doubling the speed of a tractor increases the likelihood of it turning over not twice but four times. When driving at a slow speed, the tractor operator has a much greater chance to right the machine if it strikes a hidden rock or drops into a hole or ditch. When driving down a steep grade, leave the tractor in gear to help check its forward speed.

One cause of backward tipping is hitching a load too high on the tractor. The drawbar provided on all tractors is the only safe place to hook heavy loads. In field tests at Purdue University, agricultural engineers hitched a standard farm tractor at the high level of the seat bracket to learn more about tipping speeds. They found that the tractor would tip to a critical angle--the point at which disengaging the clutch would not prevent upset--in as short a time as 7/10 of a second. Once a driver realizes that the front end of a tractor is rising, he may have less than half a second to stop it.

FARM ANIMALS

Next to falls and machinery, animals rank third among the causes of accidental injuries to farm people.

Increased reliance on artificial breeding of dairy stock has freed many farmers from the hazards of handling bulls on their farms. But wherever a bull is kept and however gentle it may appear, substantial fencing is absolutely necessary for safety.

A safekeeper bull pen of the type developed by ARS is recommended for bulls kept for dairy or beef stock breeding. The pen includes a shed with stanchion and manger, and it is so constructed that the attendant can handle and feed the animal without coming in contact with it. The plan of the safekeeper bull pen is included in FB-1412, "Care and Management of Dairy Bulls." Working plans for this and similar pens can usually be obtained through State extension agricultural engineers.

Beef bulls that run with the herd have infrequent contact with the owner. If a bull on the range or in a pasture must be approached, do so while on horseback or in a vehicle, if possible. If you must approach a bull in a pasture on foot, be sure there is a vehicle nearby to afford a barrier in case the bull should charge.

Remove the tusks from a boar. Even an ordinarily gentle animal may strike without warning. Deaths have occurred from such accidents. A hand hurdle will keep off a boar if he should attempt to strike.

Sows may be a source of danger particularly before and after farrowing. A hand hurdle should be carried when entering the pen at such times. Leave the pen door unlatched to permit a quick escape.

FARM CHEMICALS

Agricultural Research Service scientists stress the fact that farm chemicals are carefully tested before they are recommended for specific uses in controlling insects, diseases, and weeds. With proper precautions, the most potent of the recommended farm chemicals can be used safely.

But accidents show that these chemicals are not always treated with sufficient respect. Illnesses, even deaths, have occurred because enough of a toxic vapor, oil, or dust was inhaled or absorbed through the skin or accidentally swallowed.

Farmers are advised to make safety habits routine when working with such chemicals. Here are reminders--first, for dealing with any farm chemical, however mild it is believed to be, and following, some additional safeguards for use with certain organic insecticides and fungicides, with grain fumigants, and with certain herbicides.

When Working With Any Farm Chemical

- (1) Read the label. Follow directions. If antidotes are indicated on a label, have such antidotes on hand for any emergency.
- (2) Avoid needless or prolonged exposure to sprays, dusts, or vapors of any chemical, however, mild. After working with any chemical, wash exposed portions of your skin well, and change to clean clothing.

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- (3) When handling or mixing a concentrated pesticide that carries a poison label, be especially careful to protect your eyes and do not spill any on the skin or clothes. If material is spilled, remove the affected garments at once and wash the contaminated areas of the body thoroughly with soap and water. Be sure that the garments are washed free of the chemical before they are put on again.
- (4) When applying a spray or dust, don't exceed recommended dosages. Keep spray or dust off food or utensils used by man or animals. Don't risk fire by turning an oil-base spray on electric wires, outlets, or fuse boxes.
- (5) Don't leave farm chemicals where children can get to them.

When Working with Certain Organic Insecticides or Fungicides

Because of their potency, special precautions should be taken when dealing with organic phosphate insecticides, such as Metacide (methyl para-thion), TEPP, parathion, EPN, and demeton, or when dealing with organic mercury fungicides. When working outdoors with such chemicals, wear a close-fitting respirator. When mixing or applying these chemicals indoors, wear a full-face gas mask. Renew the canister of the gas mask frequently, for once saturated the canister provides no further protection.

ARS scientists have conducted research on designs of canisters for gas masks and cartridges for respirators for farm work. Purchasers may find these research-developed and tested units on the market designated as having U.S. Department of Agriculture approval. Units so far developed by ARS scientists are listed in "Respiratory Protective Devices for Agricultural Use," an article which is scheduled to appear in the August 1955 issue of the Journal of Economic Entomology.

Natural (not synthetic) rubber is the best protective material for gloves, overalls, or aprons worn when working closely with the more potent chemicals. When applying these chemicals, keep sleeves down and collar buttoned to protect the body from spray or dust. Goggles may be needed to protect the eyes from wind-blown spray or dust.

Mount spray or dust equipment at the rear of the tractor--not the front--to avoid being dosed with the chemical. Don't spray or dust at all when wind would blow a chemical out of bounds, to get on people, stock, or pasture.

Fumigants for Grain

Fumigation is recommended to protect farm-stored grain if insects attack. Most grain fumigants are organic vapors and call for precautions similar to those used with other organic insecticides. However, here are special reminders:

- (1) A respirator is not adequate protection when handling or applying a grain fumigant--wear a gas mask. Be sure that the canister of the gas mask is designed to protect you from the particular fumigant to be used. Most canisters used in this work should be replaced after 30 minutes of continuous use.
- (2) If a liquid fumigant is spilled on gloves, shoes, or other clothing, the wet chemical can blister the skin, so remove contaminated clothing at once.
- (3) When applying a fumigant, work from outside the grain bin, using a bucket pump or power sprayer, in order to avoid exposure to a heavy concentration of the fumigant.

When Working With Certain Herbicides

Many of the herbicides are in the "milder" chemical class--at the rates of application recommended for weed control. But a few herbicides require special handling. Herbicides containing arsenicals, phenylmercuric acetate, and the dinitro compounds are toxic. They should be handled with the same precautions as the more toxic organic insecticides and fungicides. Sodium chlorate should be handled with great care because of fire hazard. Clothing, shoes, wood, or vegetation that have dried after having been wetted with a sodium chlorate solution are violently inflammable or even explosive, and ignite easily by friction, sparks, or even by heat from the sun. Avoid applying dry chlorate when vegetation is wet. Prevent chlorates from collecting in cuffs, pockets, or other parts of clothing. Avoid getting clothing or wood equipment wet with chlorate spray solution. Combining certain borates or other fire-retardant materials with sodium chlorate will reduce the fire hazard.

ELECTRICITY

Circuit Loads

Farm families continue to step up the use of electricity, sometimes without assurance that their wiring can take new loads. If there is a question of wiring adequacy, check with your power company or wiring inspector. Larger wires or additional circuits may be needed to avoid the hazard of overheating.

The use on a single circuit of too many infrared heating lamps--plugged in to save young pigs, lambs, or chicks--is an example of overloading. The lamps use relatively large quantities of current. In USDA Leaflet 381, "Infrared Lamps... Their Use in Brooding Pigs," the ARS agricultural engineers include this advice among the safety precautions: Do not operate more than seven 250-watt lamps continuously on one 20-ampere No. 12 AWG branch circuit.

Electric Fences

Proper construction of an electric fence is so important that ARS engineers say: Don't build a homemade electric fence; don't use a homemade electric fence! Electric current--even very low voltages--can cause injuries to stock and persons if improperly used. The controller that keeps maximum current output within safe limits is a delicate mechanism, and making a controller for a farm fence calls for thorough understanding of the construction principles involved, as well as the right equipment to do the job. In FB-1832, "Farm Fences," ARS engineers devote several pages to the uses, advantages, disadvantages and safeguards of the electric fence. Farmers are advised to use "only those models of fence controller which have been approved by Underwriters' Laboratories, Industrial Commission of Wisconsin, or other such generally recognized institutions."

Grounding Electric Equipment

Farm people and animals run the risk of shock if electric equipment used with water or in damp places is not properly grounded.

As one example, ARS engineers cite the need to ground an electric waterer which keeps the water in stock tanks from freezing. They say: Ground the electric system, ground the frame of the water container, and ground any other conducting material, such as stanchions or a wire fence, with which the animal might come in contact while drinking.

Electric washing machines are an example of household equipment that should be grounded. Some washers come equipped with a 3-wire cord with a 3-prong plug, that grounds the machine whenever it is plugged into a special type of outlet that takes 3 prongs. A machine with only a 2-wire cord is not grounded, but it can and should be. The following procedure is recommended to ground a washer, ironer, home freezer, or other appliance used in a damp place: Attach one end of a separate length of insulated wire to the frame of the electric motor and the other end to a water pipe, which will carry the current to ground. Use a clamp fitting to keep each end of the wire firmly attached. The wire should be bare only where it attaches to the clamps.

FARMHOUSE AND GROUNDS

If a farmhouse is well planned and constructed, it will have safety built into it. Agricultural Research Service architects and housing specialists cooperate with Federal Extension and State specialists to design such plans. Working drawings are usually available through State extension services.

Here are some of the ways of building safety into a farmhouse or of removing hazards:

- (1) Be sure the porch and stair rails are sturdy. A weak rail is worse than none because it may give false confidence.

- (2) See that the upper floor has more than one exit in case the main stairway should be blocked in an emergency. A second stairway is desirable; but if it cannot be provided, an emergency exit may be a window opening onto a flat or low-pitched roof. The window should open easily, and a storm sash or screen should be a type that can be quickly removed.
- (3) Select floor coverings for entry ways, kitchen, and bathroom that will not be slippery when wet. If waxing a floor use a thin coat and rub it in well. Some waxes are nonskid. Provide grips or nonskid backing for small rugs. Install grab bars at a bathtub or shower stall.
- (4) If the light in the bathroom is turned on by a pull chain instead of a wall switch, be sure the chain is nonmetallic or at least the lower end is nonconducting.
- (5) Never turn a blow torch on a frozen pipe to thaw it. Built up steam and pressure may cause an explosion. Protect pipes against freezing by locating them on inside walls or by insulating them.
- (6) Provide clear visibility where the farm driveway enters a public road. You should be able to see several hundred feet in each direction. Many farm entrances could be made safer by cleaning brush from a fence corner, or pruning projecting tree branches, or removing a hedge.

Steps and Stairs

Falls on steps and stairs are the chief causes of injuries in rural homes, according to a Delaware survey. Housing specialists offer these pointers on stair safety--some to consider when building or remodeling, and some as improvements to make existing stairs safer:

- (1) Steep stairs may save space, but they provide less secure footing. Good proportions for indoor steps are: Treads 10 inches deep plus 1 inch overhang; risers 7 1/2 inches high. If space is not available, make treads 9 inches deep plus 1 inch overhang and risers 8 1/2 inches high. Good proportions for outdoor steps are: Treads 12 inches deep and risers 6 inches high. The steps of a stairway should be uniform, because people take stairs at an even pace by habit and an unexpectedly high or low step could cause a jar or a fall.
- (2) Try to break a long flight of stairs with a landing. Choose a flat landing rather than the space-saving device of "winders" at the right-angle turn. Steps at such a turn are a hazard.
- (3) For head protection on stairways, allow at least 7 1/2 feet of space measured vertically from the front of the tread to the ceiling or other obstruction above.

- (4) Attic stairs are often the steepest. If space is at a premium, a pull-down ladder may be safer than a very steep stair.
- (5) Install a firm handrail along at least one side of a closed stair, and on both sides of an open stair. See that all stairways, indoors and out, are lighted from top to bottom. Indoors, a 2-way switch at both top and bottom of a stair is advised. If good lighting cannot be installed promptly on a dark stairway, temporary safety measures are to paint the top and bottom steps with a broad white stripe and to keep a flashlight at the top of the stairs.

Kitchen Safety

Almost one in five home accidents serious enough to need hospital care occur in the kitchen. ARS housing specialists included a check list of kitchen safety features in Home and Garden Bulletin 12, "Your Farmhouse... Planning the Kitchen and Workroom." They point out that thought given to providing for safety when these rooms are planned "can do much to prevent such accidents as falls, cuts, fires, burns, collisions, electric shock, and asphyxiation."

In everyday kitchen work, simple precautions may avert accidents.

A step stool should be firmly built and have nonslippery treads, and legs tipped with rubber or other non-skid material. Liquids spilled on the floor should be wiped up at once.

Burns and scalds account for more than one-fourth of the kitchen accidents. Burns from steam and hot liquids are the most frequent. The lid of a hot kettle or a pressure cooker should be lifted with the far side up so the steam will escape away from the hands and face. Pot handles should always be turned so they do not project over the stove or over an adjacent burner or unit. Pot holders should be thick and dry.

For safety principles on home canning see Home and Garden Bulletin 8, "Home Canning of Fruits and Vegetables"; Home and Garden Bulletin 6, "Home Canning of Meat"; and Home Garden Garden Bulletin 30, "Pressure Canners ... Use and Care."

